Docket No.: 27702/10065
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Gary Wentworth et al.

Application No.: 10/706,196

Confirmation No.: 5990

Filed: November 12, 2003

Art Unit: 1714

For: ADHESION PROMOTERS FOR CORD-REINFORCED THERMOPLASTIC POLYMERIC MATERIALS AND SUBSTRATE/THERMOPLASTIC POLYMERIC MATERIAL COMPOSITES

Examiner: S. K. Poulos

DECLARATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

DECLARATION UNDER 37 C.F.R. §1.132 OF GARY WENTWORTH

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Now comes GARY WENTWORTH, PH.D., one of the named inventors of the invention disclosed and claimed in the above-identified application, and states as follows:

My education is as follows:

B.S. (Chemistry): Rensselaer Polytechnic Institute

Ph.D. (Organic Chemistry): Georgia Tech

2. My experience, relating to the subject matter of this patent application is as follows:

EXHIBIT
A

Thirty years in R&D in polymer related industries, including Textiles, Plastics, Coatings and Elastomers. Supervision of R&D groups ranging in size from 15 to 80 degreed professionals and technicians.

Ten years as Adjunct Professor of Chemistry at Roosevelt University of Chicago, teaching both Organic Polymer Chemistry and Physical Polymer Chemistry to students in the masters degree program.

Six years as a referee for the Journal of Organic Chemistry.

3. My patents and publication includes more than fifteen U.S. Patents and at least twelve publications in referred journals, all in the fields of polymer and organic chemistry.

4. We have found, as shown in the data of the application in Tables I, II, and III, that the claimed thermoplastic compositions, containing a combination of an adhesive resin with one or more esters of Formulas I, II, III and/or IV substantially increases the adhesion of representative thermoplastic materials to various fabric substrates.

5. As shown in Tables I, II and III (pages 25-28 of the specification), the addition of the claimed adhesion promoter combination of adhesive resin and ester unexpectedly increases the adhesion of representative thermoplastic materials to various fabric substrates.

Table I shows (compared to the control of Example 1 having no resin or ester) that the claimed resin and ester increases the adherence of **polyester polyurethane** to polyester, Aramid, and Nylon fabrics (untreated or isocyanate-treated) as follows:

POLYESTER FABRIC		ADHERENCE (lb f/in)
Ex. 1 (control)	:	0
Ex. 2 (resin + ester)	:	8.87
Ex. 3 (resin + ester)	:	6.94
Ex. 4 (resin + ester)	:	7.42

ISOCYANATE-TREATED POLYESTER FABRIC		ADHERENCE (lb f/in)
Ex. 1 (control)	:	0
Ex. 2 (resin + ester)	:	18.14
Ex. 3 (resin + ester)	:	10.11
Ex. 4 (resin + ester)	:	9.16

ARAMID FABRIC		ADHERENCE (lb f/in)
Ex. 1 (control)	:	5.04
Ex. 2 (resin + ester)	:	7.82 (55% increase)
Ex. 3 (resin + ester)	:	6.33 (26% increase)
Ex. 4 (resin + ester)	:	5.87 (17% increase)

ISOCYANATE-TREATED ARAMID FABRIC		ADHERENCE (lb f/in)
Ex. 1 (control)	:	3.4

Ex. 2 (resin + ester)	:	8.22 (142 % increase)
Ex. 3 (resin + ester)	:	4.38 (29% increase)
Ex. 4 (resin + ester)	:	6.41 (88% increase)

NYLON FABRIC		ADHERENCE (lb f/in)
Ex. 1 (control)	:	3.35
Ex. 2 (resin + ester)	:	5.67 (69% increase)
Ex. 3 (resin + ester)	:	4.57 (36% increase)
Ex. 4 (resin + ester)	:	6.15 (84% increase)

ISOCYANATE-TREATED NYLON FABRIC		ADHERENCE (lb f/in)
Ex. 1 (control)	:	4.42
Ex. 2 (resin + ester)	:	7.36 (67% increase)
Ex. 3 (resin + ester)	:	6.20 (40% increase)
Ex. 4 (resin + ester)	:	6.01 (36% increase)

Similarly, Table II (Examples 5-7) and III (Examples 9 and 10) show unexpectedly high adherence of **polyvinyl chloride** to these fabrics in comparison to the adherence of polyvinyl chloride controls (Examples 8 and 11 - no resin or ester):

POLYESTER FABRIC		ADHERENCE (lb f/in)
Ex. 8 (control)	:	6.0
Ex. 5 (resin + ester)	:	10.32 (72% increase)
Ex. 6 (resin + ester)	:	13.99 (133% increase)
Ex. 7 (resin + ester)	:	9.48 (58% increase)
Ex. 11 (control)	:	3.0
Ex. 9 (resin + ester)	:	4.1 (37% increase)
Ex. 10 (resin + ester)	:	4.3 (43% increase)

ISOCYANATE-TREATED POLYESTER FABRIC		ADHERENCE (lb f/in)
Ex. 8 (control)	:	5.8
Ex. 5 (resin + ester)	:	4.19 (28% decrease)
Ex. 6 (resin + ester)	:	9.76 (68% increase)
Ex. 7 (resin + ester)	:	10.11 (74% increase)
Ex. 11 (control)	:	3.1
Ex. 9 (resin + ester)	:	5.1 (65% increase)
Ex. 10 (resin + ester)	:	4.6 (48% increase)

6. The method of measuring cord adhesion is fully described on pages 29 and 30 of the specification.

7. These adhesion increases (with the exception of the Example 5 - Table III anomaly) are most unexpected to those skilled in the art.

8. It was extremely surprising to me that the addition of the ester(s) of claimed Formula I-IV (together with an adhesive resin) resulted in increased adhesion of the substrates to the thermoplastic compositions since, as stated in Oshiyama '381 (particularly at col. 1, lines 37-45) such esters are lubricating agents which prevent the adhesion or sticking to contacted objects.

9. When this discovery was first made, the claimed esters were added to a rubber composition reluctantly, in an attempt to provide more flexibility to a rubber conveyor belt composition with the expectation that the adhesion between the reinforcing cord and the rubber composition would decrease. The resulting substantial increase in adhesion was most unexpected.

10. These statements made herein of my own knowledge are true, and all statements made upon information and belief are believed to be true, and further these statements are made with the knowledge that willful false statements and the like, so made are punishable by fine or imprisonment, or both, under section 1001 of title 10 of the United States Code and such willful false statements may jeopardize the validity of the instant patent application or any patent issuing thereon.

Gary Wentworth

Gary Wentworth